SECTION G

FUNCTION OF TESTS PERFORMED AND PRINCIPLE OF OPERATION

GROUND CHECK

This test applies only to apparatus having a 3-wire line cord. Its purpose is to insure that the metal frame of the Tool or Appliance is connected to the ground pin of the line plug. This important connection is subjected to a low resistance continuity test. A high test current (25 amperes) is used; this simulates a heavy ground fault and assures the ability of the ground circuit to carry enough current to blow a fuse. (A frayed wire with only one or two strands left will melt open and force a repair.) Refer to the schematic circuit diagram of Figure 4 at the end of this section.

The Test Set performs the ground check test when S1 is set to Ground (1) position. Transformer T2 primary is energized from the supply in series with the GOOD indicator lamp DS7 (shunted by R33) and resistor R11. The presence of supply voltage is indicated by pilot lamp DS8 (in series with R22). The secondary of T2 (two 5-volt windings in parallel) is the source of the testing voltage. The current path of T2 secondary is traced from T2 to the ground pin of J2 and so to the apparatus under test (AUT), assuming continuity, to the frame of the apparatus. The current path is completed by the Frame probe connection to the frame of the AUT back to the T2 secondary.

The secondary current in T2 is reflected back to the primary and causes the GOOD lamp DS7 to have sufficient current to light at full brilliance. A resistance path above 0.15 ohms in T2 secondary will limit the current so that the GOOD lamp will be dim or not light.

This test should not be operated continuously with the GOOD lamp at full brilliance for more than 3 minutes to prevent overheating of the transformer.

LEAKAGE

The leakage tests determine if a conductive path exists for excessive "leakage" current between the frame of the AUT and either wire of the power line. Such leakage is a direct shock hazard.

Because leakage testing is so important, the Test Set is equipped with a self-testing feature to verify all leakage measurements. The Test Set performs this function when S1 is in the Leakage position. The supply voltage is applied to the primary of T5 (1 and 4). The presence of supply voltage causes the caution lamp

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F. Insulation Breakdown

1. Set the Test Voltage control to zero.

2. Set the Mode selector switch to the Insulation Breakdown (3) position.

   2.1 The red CAUTION lamp will flash.

3. Raise the voltage by clockwise rotation of the Test Voltage control. Set the Test Voltage to the required value, usually 1000 volts, by observing the AC VOLTS meter.

4. A failure of the AUT will be indicated by the sounding of the alarm buzzer. Also the voltmeter reading may fluctuate or drop suddenly.

   4.1 If failure occurs, quickly return the Test Voltage control to zero and the Mode Selector switch to OFF. Examine and repair any AUT that has failed this test before putting it into service.

G. Shutdown

1. Testing can be stopped at any time by moving the Mode Selector switch to the OFF position.

2. Set the Mode Selector switch to OFF whenever connecting or disconnecting the AUT.

H. Testing Extension Cords

Extension cords are tested by the same procedures as used for other items. The Ground Check is a test of green wire continuity. The Leakage and Breakdown tests are applied between the green wire and the black and white wires. Note that the Leakage and Breakdown tests are applied only to the insulation between conductors within the cord. Leakage from a supply conductor through the outer cable jacket is not checked unless special arrangements are used.

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